

**NEW SPECIES OF BEES OF THE GENUS DIADASIA
FROM CALIFORNIA (HYMENOPTERA,
APOIDEA).**

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Diadasia lutzii Ckll.

Through the courtesy of Doctor Cockerell I have had the privilege of examining paratypes of this species from Green River, Wyoming (Lutz). Unexpectedly, *lutzii* proves to be very similar to two forms of *Diadasia* found on the deserts of California, and because of the close agreement in most characters it seems advisable to regard the latter as races of *lutzii*. The males of the three forms are extremely similar, but I find small differences in the genitalia, which, however, appear not to be entirely constant between the two California races. The females are more easily separated, but the differences are chiefly in color of the pubescence, although the clypeus in the California races is much more closely punctured than in *lutzii*.

Diadasia lutzii difficilis n. subsp.

Male.—Like *lutzii*, but teeth at apex of tergite 7 finer and not divergent. Genitalia similar except as follows: Inferior apical appendage of stipites less acuminate at apex and curvature of its outer margin forming a much shorter arc restricted to basal third. Superior apical appendage much smaller than in *lutzii*, about one-fifth to one-fourth as long as inferior appendage. Hair of abdomen erect, moderately long and dense, that at apex of tergites 2 to 6 depressed and forming a narrow white band. Hair on basal half, or more, of tergites 3 to 6 and all on 7, except marginal fringe, black. Some of the long erect hair just preceding apical band on 3 to 6 light, whereas in *lutzii* the white hair is more definitely restricted to the depressed apical band. Hair of venter mainly light, but fuscous on blackish on ventrites 4 and 5 except apical fringe. (Hair of venter in *lutzii* nearly all dark.) Pile of ventrite 6 blackish, rather dense across apical margin and forming a dense longer tuft on each side at base, just as in *lutzii*. Pubescence on upper parts of head and thorax varying from pale fulvo-ochraceous to nearly cinereous. Apex of hind tibiae beneath with a weak blunt lobe over base of spurs. Length, 7–8.5 mm.; anterior wing, 5.6–6.2 mm.

Female.—General appearance almost exactly as in *lutzii* but

differing as follows: Punctures of clypeus much closer, more or less sulcate, the surface comparatively rugose. Apical margin of tergites very narrowly whitish hyaline beneath the bands. Pubescence whitish, usually becoming pale brownish ochraceous on mesonotum. Hair at base of tergites 2 to 4 and to a less extent at base of 5, black, but that on 2 sometimes nearly all light. (Abdomen in *lutzi* has no dark hair except at apex and beneath.) Apical bands as seen from above under a lens broadening in middle, not sharply defined, but appearing to naked eye narrow, white and marginal. Hair of venter mainly black, but apical fringe of ventrites 3 and 4 more or less white on each side. Scopa of hind legs brownish fuscous, sometimes a little paler beneath. Length, 8-9 mm.; anterior wing, 6-6.2 mm.

Holotype male and allotype, mouth of Andreas Canyon, near Palm Springs, California, at flowers of *Sphaeralcea ambigua*, March 24, 1933 (Timberlake). The following are paratypes: 11 males, 4 females, at same flower and place, March 24 to April 24; 3 males, near mouth of Murray Canyon, at same flower, March 21; 1 male, Palm Canyon, on *Sphaeralcea rosacea*, March 25; 1 male, near Westmoreland, on *Sphaeralcea orcutti*, May 31; 1 female, Cave Springs, San Bernardino County, on *Sphaeralcea ambigua*, April 30; 3 males, Tolleson, Arizona, on *Sphaeralcea*, May 29 (all Timberlake); and 1 male, San Quentin, Lower California, April 10 (B. J. Hall). The following paratypes were collected by C. D. Michener and belong in his collection: 1 male, Andreas Canyon, April 10; 1 female, 15 miles south of Twenty-nine Palms, April 14; and 2 males, 2 females, Westgard Pass, Inyo County, males collected May 27, the females June 15 at summit. All the Michener specimens at flowers of *Sphaeralcea ambigua*.

Diadasia lutzi deserticola n. subsp.

Male.—Not distinguishable from *difficilis* except by the genitalia. Inferior apical appendages of stipites narrow, slightly dilated at base and slightly tapering to apex. Superior apical appendage smaller than in *difficilis*, hardly more than one-sixth as long as inferior appendage. Length, 7-8.5 mm.; anterior wing, 5.5-6 mm.

Female.—Differs from *difficilis* in having the light hair of abdomen ochraceous instead of white, and very little black hair at base of tergites 2 to 4. The black usually restricted to the coarser, erect, interspersed hairs, although in one specimen there is a small amount of depressed black hair at extreme base

of tergites 3 and 4. From *lutzi* it differs in the much closer, more sulcate puncturation of clypeus and the ochraceous hair of tergites, interspersed on the base of the segments with erect dark hairs. The apical bands are dense but grade insensibly into the thinner hair covering disk of tergites. Scopa of hind legs with much more light hair on underside than in either *lutzi* or *difficilis*. Length, 7–8 mm.; anterior wing, 5.8–6 mm.

Described from 5 males, 3 females (holotype male, allotype and paratypes), Salt Creek, Chocolate Mountains, Imperial County, California, at flowers of *Sphaeralcea ambigua*, March 19 and 20, 1927 (Timberlake).

One of the paratype males has genitalia practically as in *difficilis*, and another has them somewhat intermediate. This subspecies is evidently a local race that may prove to be restricted to the Chocolate Mountains on the east side of the Salton Sink.

Diadasia vallicola n. sp.

Most similar to *D. afflicta* (Cress.), but hair of abdomen longer, the pale hair-bands appearing wider when viewed from the side, as some of the long as well as the shorter depressed apical hair is whitish, and differing also decidedly in the male genitalia.

Male.—Black, the tarsi rufescent, spurs testaceous. Flagellum brown beneath except at base. Tegulae ferruginous, darker at base. Wings nearly clear hyaline. Nervures brownish fuscous, the middle of stigma ferruginous. Head broader than long, the inner orbits divergent above. Third antennal joint nearly equally 4 + 5, the middle joints of flagellum as long as wide. Head and thorax shining, finely and closely punctured. Punctures on cheeks and on each side of vertex very fine and weak. A large impunctate area on each side of vertex, just exterior to the lateral ocelli. Posterior middle of mesocutum more or less sparsely punctured. Basal area of propodeum polished. Middle and hind femora and tibiae moderately incrassate, the hind tibiae less swollen than in *afflicta*, with a shorter, less distinct basal neck. Under side of hind tibiae not lobate at apex over base of spurs. Spurs weakly hooked at apex. Two apical teeth of tergite 7 small, hardly differing from *afflicta*. Pubescence brownish to pale ochraceous, paler or whitish beneath, moderately long and dense on head and thorax, but area between upper ends of eyes nearly nude. Hair on outer side of tibiae rather dense, denser than in *afflicta*. Hair of abdomen rather long and erect, becoming shorter and depressed at apex of tergites 2 to 5, and

shorter across the base of 2 to 6. Hair of tergites 1 and 2 entirely light, not appreciably longer on the base of 1, as it is in *afflicta* and other species. Hair on basal half, more or less, of tergites 3 to 6 black, the remaining hair ochraceous or whitish, the apical band consequently not sharply defined because of the light long erect hair preceding it. Hair of tergite 7 more or less black on disk and ochraceous at margins. Hair of venter light, especially the apical fringes, but with much brown or fuscous hair on disk of ventrites 4 and 5. Ventrite 6 covered with short erect brown pile, which becomes about twice as long but hardly denser to form an inconspicuous tuft on each side at base. (In *afflicta* the pile of ventrite 6 is uniformly short.) Length, about 9 mm.; anterior wing, 6.9-7.1 mm.

Holotype male at flowers of *Sphaeralcea orcutti*, near Westmoreland, Imperial County, California, May 31, 1930 (Timberlake). Also 3 male paratypes from Arizona, all on *Sphaeralcea*: One at Tolleson, May 28, 1933 (Timberlake), one at Wickenburg, March 30, 1934 (Timberlake), and one on the Silverbell road, 12 miles west of Rillito, May 2-5, 1935 (A. J. Basinger).

The Arizona specimens have darker tarsi and tegulae than the type.

Diadasia martialis n. sp.

Allied to *D. nitidifrons* Ckll., but basal area of propodeum polished, the base of tergites with much more black hair, the light apical bands better developed and mesoscutum almost uniformly and rather closely punctured, instead of subimpunctate on the posterior middle. The females are more similar than the males, but distinguishable by the sculpture of the basal area and mesoscutum. From *D. consociata* Timb. it differs in larger size and longer, more erect pubescence.

Male.—Black, the tarsi rufescent. Spurs ferruginous. Flagellum sometimes reddened beneath. Tegulae either almost black, or more or less rufescent especially on outer margin. Wings dusky hyaline, the nervures black. Head distinctly broader than long, the inner orbits diverging above. Third antennal joint slightly shorter than 4+5, the middle joints of flagellum as long as wide. Middle and hind femora and tibiae moderately incrassate. Hind tibiae produced at apex beneath in a short blunt lobe over insertion of spurs. Hind basitarsi curved as usual, the apex slightly dilated and truncate. Apical teeth of tergite 7 varying from short and

blunt to rather long and slender. Apical margin of ventrite 5 emarginate at middle. Head and thorax shining, finely, rather closely punctured, most closely on the face and clypeus. Sides of vertex more minutely punctured, with a large impunctate space just exterior to lateral ocelli. Punctures of mesoscutum almost uniformly spaced, those on anterior part of scutellum a little sparser. Basal area of propodeum polished. Pubescence rather long and dense, ochraceous, becoming almost white on face, under parts and front femora. Area between upper ends of eyes nearly nude as usual. Hair of mesonotum erect, uniform in length and density. Hair of abdomen erect, but not quite as long and shaggy as in *nitidifrons*. Depressed hair at apex of tergites 2 to 5 forming a narrow even pale ochraceous or whitish band. Band at apex of 6 broader, more ochraceous. Basal half, or a little more, of tergites 3 to 6 covered with black hair, and the hair of the remainder of disk long and ochraceous. Hair of tergite 7 dark ferruginous, appearing black in some aspects, becoming more or less paler at apex. Hair of venter sometimes entirely ochraceous except on last segment, or with more or less brownish or fuscous hair on ventrites 3 to 5. Ventrite 6 with dense, moderately long, erect, fuscous pile on apical half. Hair on outer side of tibiae and basitarsi rather dense and ochraceous. Length, 8-10 mm.; anterior wing, 7.1-7.8 mm.

Female.—Much like the male. Mandibles sometimes with a large testaceous yellow spot near apex. Clypeus moderately coarsely and closely punctured. Pubescence similar, but becoming short, rather thin and appressed on middle of mesoscutum. Hair of abdomen mainly appressed, except at base of first tergite. More than basal half of tergites 2 to 4 and base of 5 with black hair. Apical bands on 1 to 4 ochraceous or white, rather broad, widening on middle of 3 and 4. Tergite 5 with a broad light band. Hair on apical margin of 5 and on sides of 6 dark ferruginous or black. Hair of venter black except at sides. Scopa of hind legs ochraceous, sometimes a little infuscated above and on basitarsi. Hair on inner side of hind basitarsi dark ferruginous or black. Hair on under side of front femora long, moderately dense, nearly white, that on inner side of front basitarsi ferruginous. Length, 8-9 mm.; anterior wing, 6.2-7.2 mm.

Described from 5 males, 3 females (holotype male, allotype and paratypes) collected at Salt Creek, Chocolate Mountains, Imperial County, California, at flowers of *Sphaeralcea ambigua*, March 19-20, 1927 (Timberlake). Also the following paratypes: 6 males,

2 females, Palm Canyon, Riverside County, on *Sphaeralcea rosacea*, March 25; 1 female, near Murray Canyon, on *Sphaeralcea ambigua*, March 21; 8 males, near mouth of Andreas Canyon, on same flower, April 19 and 22; 1 male, La Quinta, on *Sphaeralcea rosacea*, April 24; 2 females, 28 miles south of Twenty-nine Palms, on *Sphaeralcea ambigua*, April 14, (all Timberlake); 2 males, Tahquitz Canyon, near Palm Springs, on *Larrea divaricata*, March 24 (C. M. Dammers); and 1 female, mouth of Andreas Canyon, on *Sphaeralcea ambigua*, April 10 (C. D. Michener) in Michener collection.

Diadasia palmarum n. sp.

Allied to *D. lutzi* Ckll., but larger, hair of abdomen more depressed, that of seventh tergite usually light, and sixth ventrite with short dense pile at apex, nude across the middle and with a large dense brush of hair on each side of base nearly meeting in the middle. The female differs from *lutzi* in having finer closer punctures on the clypeus, scopa much paler, and hair at apex of abdomen ferruginous or chocolate brown.

Male.—Black, the tarsi and under side of flagellum rufescent. Small joints of tarsi, more or less, and spurs ferruginous. Tegulae piceous, or more or less rufescent on outer margin. Wings dusky hyaline, nervures piceous. Head broader than long, inner orbits divergent above. Third antennal joint nearly equalling 4 + 5, the middle joints of flagellum as long as wide. Middle and hind femora and tibiae moderately incrassate. Hind tibiae not lobate beneath at apex. Hind basitarsi curved as usual, very obliquely truncate at apex. Head and thorax finely and closely punctured, the punctures weaker as usual on vertex. A small impunctate area just exterior to each posterior ocellus. Punctures of pleura and posterior part of mesoscutum sparser, with an impunctate space on each side of the posterior middle of the latter. Basal area of propodeum polished. Apical teeth of seventh tergite short and blunt, separated by a space equal to, or much less than, their own width. Pubescence ochraceous, paler beneath, rather long and dense on head and thorax. Space between upper ends of eyes nearly nude. Pubescence of abdomen ochraceous, black on basal half of tergites 3 to 6, the appressed apical band on 2 to 6 narrow and more or less whitish. Hair of tergites 1 and 2 erect, that on following segments somewhat depressed, especially on basal half. Hair of tergite 7 usually light, sometimes black at base. Hair of venter light, but tinged with brown on ventrite 6, that on 5 and base of 6

very dense. Hair of legs ochraceous, more whitish on front pair, that on outer side of tibiae and basitarsi rather dense. Length, 9–10 mm.; anterior wing, 6.8–7.5 mm.

Female.—Similar to male. Mandibles sometimes with a testaceous yellow mark subapically. Punctures of clypeus a little coarser than those of frons and rather denser. Posterior middle of mesoscutum nude and impunctate. Pubescence pale ochraceous, or cinereous, mainly depressed on abdomen except at base of first tergite. Hair on basal half of tergites 3 to 5 black. Apical band on 1 to 4 broad, whitish, slightly emarginate on each side anteriorly on 3 and 4. Apical band on tergite 5 and hair on sides of 6 ferruginous or chocolate brown. Hair of venter brown, the apical fringe of ventrite 4 and that of 3 on each side, white. Scopa of hind legs ochraceous, slightly tinged with brown, especially on basitarsi. Hair on inner side of basitarsi dark ferruginous or blackish. Long hair on under side of front femora moderately dense and whitish. Length, 8–10 mm.; anterior wing, 6.6–7 mm.

Described from 10 males, 9 females (holotype male, allotype and paratypes) taken near mouth of Andreas Canyon, Riverside County, California, all at flowers of *Sphaeralcea ambigua*, except one female on *Eriogonum fasciculatum*, var. *polifolium*, March 24 to April 24; and 1 male (paratype) on *Sphaeralcea rosacea*, La Quinta, April 24 (Timberlake).

Diadasia australis californica n. subsp.

This subspecies of *D. australis* (Cress.) has formerly been confused with *D. opuntiae* Ckll. and some records and many determinations of *opuntiae* belong with *californica*. *D. opuntiae* was described from the female from San Pedro, California, and the male has been described recently and associated with the female by Doctor Cockerell. It appears to be confined to a narrow coastal strip from San Diego northward to Santa Barbara and also occurs on some of the islands. *D. australis californica* occupies a more interior area and extends to both deserts.

Female.—Differs from typical *australis* from Colorado in having more or less black or fuscous hair at base of tergites 2 to 4, the pale hair being confined to a broad apical band more or less widened in the middle. The pubescence in general and especially that of the mesonotum usually has a brighter and more fulvous tinge than in *australis*. The dorsal half of scopa of hind legs tinged with pale brown. The pubescence and banding of abdomen that easily separates it from *australis*

causes difficulty, however, in its separation from either *D. opuntiae* Ckll., or *D. rinconis* Ckll. From *opuntiae* it differs in having a smaller, more funnel-shaped and duller enclosure on the propodeum. The pubescence and puncturation of the mesoscutum also a little less dense. From *rinconis* it probably can not in all cases be distinguished with certainty, but the average size is distinctly larger and the pubescence more tinged with fulvous. (The pubescence in *rinconis* strongly verges to cinereous.) Third antennal joint somewhat more than twice as long as its apical thickness and a little longer than joints 4 and 5 combined. (In *rinconis* joint 3 about twice as long as its apical thickness and equal or subequal to 4+5.) The lateral part of vertex between the ocelli and nearest eye margin minutely tessellate and very finely punctured. (In *rinconis* this area is polished and there is a large impunctate space on each side extending obliquely outward from the lateral ocellus to the summit of the eye.) Pubescence of scutellum and posterior part of mesoscutum a little longer and less depressed than in *rinconis*. In *rinconis* the pale hair band on tergite 2 extends broadly forward to the base on each lateral margin. In *californica* these lateral extensions of the band are less marked. The hind knee plate of *californica* on the average is narrower and has a straighter posterior margin than in *rinconis*. Length, 12-14 mm.; anterior wing, 8.8-10 mm.

Male.—Agrees structurally with *D. australis* (Cress.) and is hardly distinguishable except that it averages larger in size and usually has a brighter and more fulvo-ochraceous pubescence. It differs from *D. opuntiae* in the duller enclosure of propodeum and the comma-shaped process on hind basitarsi. (In *opuntiae* this process is evenly expanded and rounded at apex and reaches about the middle of following joint.) From *D. rinconis* it differs in its average larger size and usually brighter pubescence and is distinguished with certainty by the genitalia. In *californica* the inferior apical process of stipites is comparatively slender, somewhat ovally expanded toward the apex and depressed throughout. In *rinconis* the process is broadly dilated on apical half, distinctly thickened dorso-ventrally on basal part and abruptly depressed just beyond the beginning of the expansion into a thin laminate plate. Length, 10-15 mm. (only exceptionally under 12 mm.); anterior wing 8.2-11.5 mm.

The following specimens are paratypes except the holotype female and allotype as specified below: 36 females, 33 males (including holotype and allotype), Riverside, California, April 11 to

June 9, all at flowers of *Opuntia*, except three at nests in ground, and one male each on *Rhaphanus sativus*, *Convolvulus occidentalis* and *Mesembryanthemum chilense*; 1 male, 1 female, Whittier and Puente Hills, May 8 and June 24, on *Opuntia littoralis*; 3 males, 2 females, Claremont (Baker) and 1 male, 1 female, June 23 (D. W. Clancy); 1 male, two miles west of Perris, April 13, on *Astragalus pomonensis*; 3 males, 1 female, the Gavilan, on *Opuntia*, May 26 (C. M. Dammers), 1 male, June 10 (Dammers), 1 male, June 2, on *Helianthus gracilentus*, and 5 females on *Salvia carduacea* (not collecting pollen), May 31; 1 male, 1 female, four miles south of Fallbrook, June 24, on *Opuntia occidentalis*; 1 male, 1 female, San Bernardino, on *Opuntia*, May 12 (Dammers); 3 males, Forest Home, San Bernardino Mts., on *Cirsium californicum*, June 6; 1 male, Lytle Creek, on *Opuntia*, June 6; 1 male, near Banning, on *Opuntia basilaris*, April 23; 2 males, Whitewater Canyon, on *Opuntia basilaris* and *Cereus engelmannii*, April 25; 1 male, Andreas Canyon, on *Sphaeralcea ambigua*, March 24, 1 female on *Opuntia echinocarpa*, April 24; 2 males, Palm Canyon (Riverside County), March 9 (H. S. Smith); 1 male, six miles south of Morongo, on *Echinocactus acanthodes*, April 22; 1 male, Mohave Desert, south of the Arawatz Mts., on *Aster abatus*, April 30; 2 females, Barstow, on *Opuntia*, May 10 (Cockerell); and 1 male, 1 female, Alberhill, on *Opuntia*, May 30 (Dammers). Also the following in collection of C. D. Michener: 4 males, 4 females, Riverside, on *Opuntia*, April 12 to May 7; 1 male, 1 female, Altadena, on *Opuntia*, June 1 (Michener); 1 male, Eagle Rock Hills, on *Cirsium*, June 22 (Michener); 1 male, seven miles south of Whitewater, on *Echinocactus acanthodes*, April 13 (Michener); 2 females, Mazourka Canyon, Inyo Mts., on *Opuntia basilaris*, May 25 (Michener); and 1 male, fifteen miles northwest of Lone Pine, Inyo County, on *Opuntia*, May 21 (Michener). Of the specimens recorded above all not otherwise specified were collected by the writer.

Another female from Inyo County is not made a paratype as it shows the characters of typical *australis*. This was collected at the summit of Westgard Pass, on *Opuntia*, June 15 (Michener). It is also interesting to note that a female of *australis* collected by Michener at Boulder, Colorado, July 6, shows the apical bands and dark basal hair on the tergites, that are characteristic of *californica*.

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